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## Sustainable Socio-Cultural Guidelines for Neighborhood Design in Jeddah

Khadijah Fatani <sup>a\*</sup>, Mady Mohamed <sup>b</sup>, Samah Al-Khateeb <sup>c</sup>

<sup>a</sup>Master Student, Effat University, Jeddah 21478, KSA

<sup>b</sup>Associate Professor, Effat University, Jeddah 21478 KSA (on leave, Zagazig University, Egypt)

<sup>c</sup>Assistant Professor, Effat University, Jeddah 21478,, KSA (on leave, Ein Shams University, Egypt)

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### Abstract

The current paper<sup>1</sup> aims at developing a set of design guidelines that promotes the concept of socially sustainable neighbourhoods in Saudi Arabia. Nowadays, several rating systems and urban design codes around the world set guidelines for urban design development and particularly in neighbourhood design. The research problem is; these rating systems cannot be applied in the context of Saudi Arabia without considering its local social and cultural aspects. The paper resulted as a reaction to the abbreviation of socio-cultural aspects in neighbourhood design approaches. The paper presents a set of design guidelines adjusted to fit the context of Jeddah City.

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*Keywords:* Social and cultural aspects; Urban Design; Neighborhood; and Rating systems.

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### 1. Introduction and research problem

The population growth and the urban neighbourhood development in the cities around the world are inevitable. Today, many neighbourhoods around the world are suffering from several problems. These problems affected the culture, social interaction, economic aspects as well as environmental impacts. Accordingly, urban development should address social and cultural aspects of each particular community within the environmental and economic contexts.

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\* Khadijah Fatani. Tel.: +966-5568-68194.  
E-mail address: [khadijahfatani@gmail.com](mailto:khadijahfatani@gmail.com)

Recently, new neighbourhood design approaches and systems are emerging to address neighbourhood problems. These approaches and systems appeared to guide city planners and developers to better address nowadays problems with solutions. A well-known design approach is Sustainable Neighbourhood Development. One example of Sustainable Neighbourhood Development is New-Urbanism. The concept and principles of New-Urbanism approach were adapted by some noted international rating systems such as LEED for neighbourhood development. Other notable regional assessment tools are Pearl in UAE and QSAS in Qatar.

Previous studies raised several important points. On one hand; traditional ways of design in the Middle East and West have better addressed their own cultures and natural environments. On the other hand since the modern period in 1950; Middle Eastern design approaches specifically in KSA followed Western foreign ways of design. Moreover; the modern period presented influential aspects causing severe harm to the built environment of Saudi Arabia. Many opposition attempts to modern approaches towards sustainability appeared; abbreviating socio-cultural aspects and became environmentally oriented to Western environments. Due to the previous; regional attempts have emerged aiming to address their own socio-cultural aspects and climatic conditions.

Saudi Arabia is considered the largest country in the Gulf region. The large area of the kingdom includes various types of topography, climatic conditions, social and cultural aspects<sup>1</sup>. Kingdom of Saudi Arabia was divided into four main regions, each having its own socio-cultural and environmental significance; due to its large area<sup>2</sup>. The central region (Najdi Model) includes the capital of KSA; Riyadh city. Western region (Red Sea Basin Model – Hejazi Model) that includes an important commercial trade sea port and a gate of the two holy mosques; Jeddah city<sup>3</sup>. The Eastern region (Arabian Gulf Model-Shargawi Model) which hosts most of the petroleum industry in the kingdom<sup>4</sup>. The final region is the Southern region (Al-Sarah Model).

In a society such as Saudi Arabian society, socio-cultural aspects are major considerations. The term socio-cultural aspects combine both social and cultural factors which indicate "the unity between society and culture which forms a system or set of rules that govern the human behaviour of a group of people"<sup>5</sup>. Socio-cultural in relation to the built physical environment; the physical environment should be designed according to a set of rules that reflect and respect the culture of inhabitants to increase social relationships and interactions.

Saudi design approaches are still following Western approaches which may cause lack of socio-cultural aspects and climatic considerations to continue in the design of Saudi neighborhoods. In brief; current neighborhoods are not related to the socio-cultural aspects of Saudi communities which correspondently made it socially unsustainable.

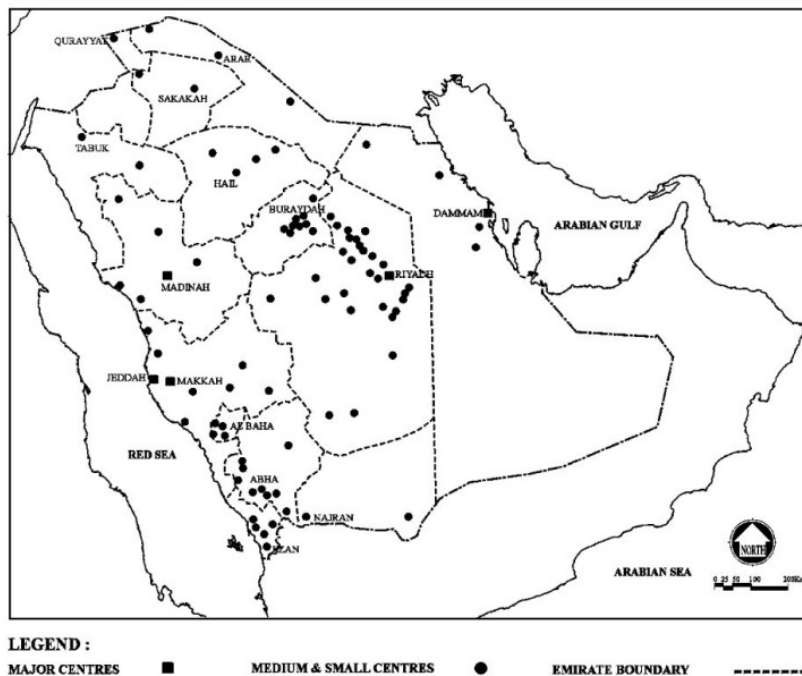


Fig. 1. Major Urban Areas in The Kingdom<sup>6</sup>

## 2. Aim and objectives

The paper main aim is to propose a set of design guidelines governed with bio-climatic considerations and cultural aspects to stimulate social sustainability in Jeddah's neighbourhoods. These design guidelines promotes a leading approach to the concept of socially sustainable neighbourhoods in the kingdom. To achieve this aim; the following objectives should be fulfilled:

- Review the historical background of Neighbourhood design;
- Analyse the modern trail for neighbourhood design to identify common problems;
- Investigate previous and new neighbourhood design approaches and theories;
- Formulate a final set of guidelines for neighbourhood design based on the historical review and the new approaches.

## 3. Research methodology

This paper depends on the procedures of a scientific study; which includes the following stages. Stage one is a fact recoding through observation and analysis process to identify Jeddah's neighbourhoods current situation and problems. Building a preliminary theory is the second stage done through an analytical review to formulate the guidelines. The final stage which is an experimental situation; aiming to validate the proposed guidelines through a field study will be published later in another paper.

## 4. Historical background

The following sections focused on the traditional approaches of neighbourhood design in the Middle East and the West. First section will review the work and studies of professionals in the field; concerning the traditional neighbourhood design of the Middle East, focusing on the context of Saudi Arabia, in specific Jeddah city. The second section will present important original traditional concepts of the West. The final section is concerned with related terms.

### 4.1 Traditional neighbourhood design approaches of the Middle East

Since the first emerge of the Arabian neighbourhood in Yathrib, all Arabian neighbourhoods begun to develop. Traditional neighbourhoods in Saudi Arabia have several similarities of design principles of the traditional neighbourhoods in the Middle East regions with some differentiations that vary from region to the other<sup>7</sup>. *"Traditional Islamic communities achieved a harmonious integration of private space and areas inviting the gathering of people. Networks of streets became exciting passageways inviting visual and intellectual Delights"*<sup>8</sup>. From the above discussions, the traditional Arabic neighbourhood was designed according to certain design aspects and considerations. The considerations aim to acknowledge the supreme goal of traditional design *"No harm and no reciprocated harm"*<sup>9</sup>. Jamel Akbar explains, there is no rule in urbanism and development as long as it doesn't bring any harm.

These aspects and considerations were not confined or documented as specific approaches in design. In response to the lack of documentation of Arabian neighbourhood design approaches, this section provides an analysis of previous attempts of experts in the field of Middle Eastern neighbourhood design. Based on the analysis of the work of Saleh Al-Hathloul<sup>1,7</sup>, Abdulbagi Ibrahim<sup>10</sup>, Jameel Akbar<sup>9</sup> and Mohammed Eben Saleh<sup>8,11</sup>; these are the concluded traditional Middle Eastern neighbourhood design principles: Privacy, courtyard, thermal comfort, hierarchy in open spaces, neighbourhood centre, markets, building projections, street networks, building morphology, local building materials, unity and harmony, community role, neighbourhood council, safety and security.

Aforementioned; each region has its own socio-cultural aspects and environmental conditions. The hot-humid climate conditions in Jeddah have affected its traditional ways of design. Jeddah's traditional morphology have well addressed its climatic conditions; presenting a high quality of building techniques and technology<sup>12</sup>. Based on Mohammad Kamal work, table 1 presents significant design principles obtained from the traditional morphological pattern of Old Jeddah.

Table 1. Old Jeddah Design Principles in Response to Climatic Conditions<sup>12</sup>, done by the authors.

Old Jeddah Design Principles in Response to Climatic Conditions	
<b>Buildings</b>	
• Detached buildings	→To allow air movements around buildings.
• Varity of Building Heights	→Ranging from 5 to 8 stories.
• Tower Like Buildings	→With total heights of 15 to 18 meters.
<b>Streets</b>	
• Adequate Street Widths	→Between tall buildings to provide shade and shadow: <ul style="list-style-type: none"> <li>• Secondary streets: 2 – 4 meters.</li> <li>• Primary streets: 4 – 10 meters.</li> <li>• Main streets: 12 – 20 meters.</li> </ul>
• Orientation of Streets	→Wide streets: north – south direction at right angle to sun path. →Side streets: narrow with bends and shaded by building projections.
<b>Open Spaces</b>	
Located at Street intersections	→To provide focal points.
Associated with Streets	→It provides convection system.
<p>Note: Urban Convection System; It deals with the motion of air, where cool air is drawn down to the side streets to replace the hot light air coming from open spaces to allow for good air movements and ventilation in urban environments.</p>	

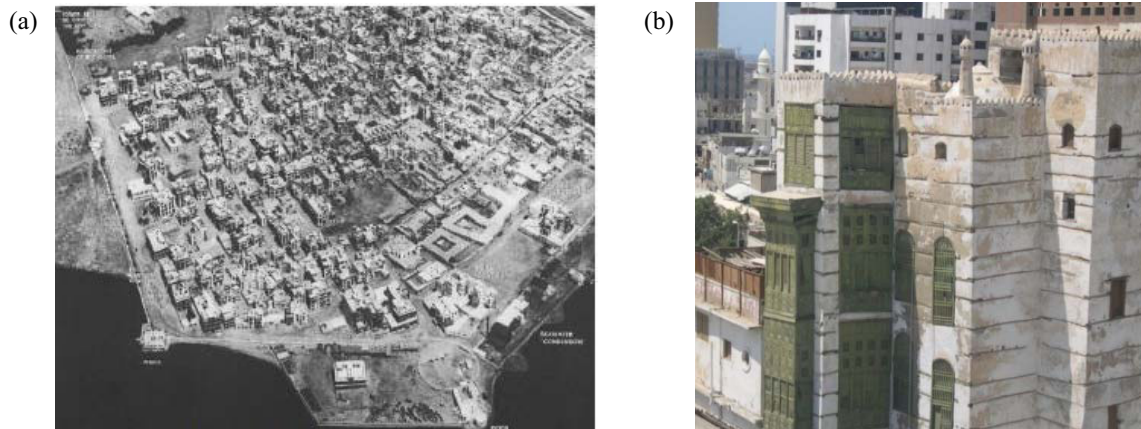


Fig. 2. (a) Jeddah in 1940<sup>3</sup>; (b) Bird View For Jeddah, Taken by: (the third author, 2011).

In May 2016; UNHHSF have issued a new strategy for sustainable neighbourhood planning. This strategy included five main principles and seven policies. The Social Mix principle is the main concern of this study promoting more (high levels of) social interaction and cohesion across groups. The selected policy to achieve social mix is through urban and housing design<sup>13</sup>.

In relevance to the hot-humid climate of Jeddah; Givoni presented related guidelines addressing the mentioned climate condition. Table 2; provides an analytical demonstration of neighbourhood design considerations related to the context of Jeddah; derived from the work of Givoni for hot-humid environments<sup>14</sup>.

Table 2. Hot-Humid Climatic Considerations for Neighbourhood Design<sup>14</sup>, done by the authors.

Givoni's Hot-Humid Climatic Considerations for Neighbourhood Design	
Street Network Layout	
→ Ventilation	1. Provide good ventilation condition for pedestrians. 2. Provide good potential ventilation for buildings along the streets.
→ Shade	1. Provide shading by natural elements. 2. Provide shading by special details of buildings form.
Note: When conflict between provision of ventilation and shading in hot-humid climates; ventilation is more important to achieve.	
→ Orientation	1. Wide main avenues oriented towards an oblique angle of 30 degrees to prevailing wind.
Urban Density	
→ The higher the density the poorer the ventilation.	
Building Heights	
→ Urban profile of different heights	
→ Long building facades are oblique to wind.	
→ Narrow "Tower Like" building type.	
→ Detached housing.	

#### 4.2 Traditional design approaches of the West

According to Nicholas Particos, one of the most remarkable landmarks of urban planning in 20<sup>th</sup> century is the neighbourhood design concept. Turning the concept of neighbourhood into an applied design approach was first addressed by Clarence Perry in 1929. The two main original approaches of neighbourhood design of the West are the neighbourhood unit by Clarence Perry and Radburn Model by Clarence Stein and Henry Wright.

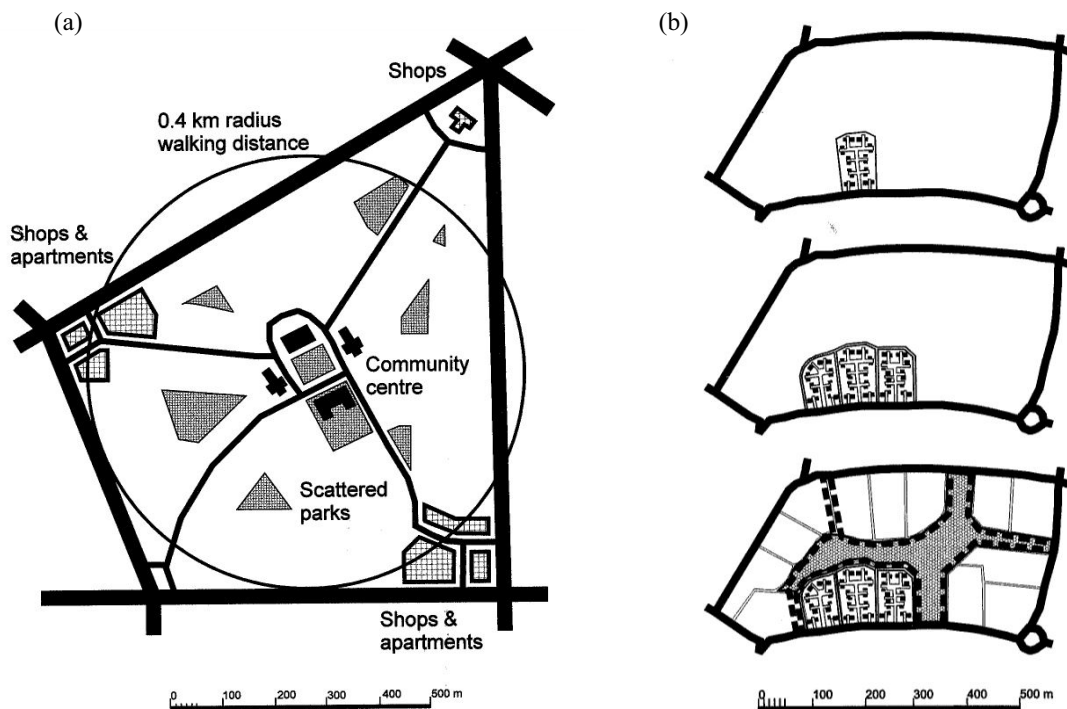


Fig. 3. (a) Clarence Perry's – Neighborhood Unit; (b) Radburn Model – Enclave(top), block(middle), superblock (bottom)<sup>15</sup>.

The neighbourhood unit is considered a successful one that became the base of New Urbanism and Sustainable neighbourhood approaches today. The successful factors of the Neighbourhood Unit approach can be summarized in; Central area, Clear neighbourhood boundaries, Protective stripes, Open spaces distributions, Pedestrian oriented, high density and Mixed land uses<sup>16</sup>. On the other hand; Radburn Model is a hierarchical design approach consists of four levels which are: enclave, block, superblock, and neighbourhood. In summary, Radburn Model principles are; Pedestrian oriented, tangible centre, Open spaces, High density, Clear Boundaries, Mixed land uses and Safety<sup>15</sup>.

After analysing the principles of the traditional ways of neighbourhood design in the Middle East – focusing on Jeddah – and the West; it is evident that both have addressed their socio-cultural aspects and climatic conditions. The main obtained cultural aspects are; privacy, religious aspects, economic base, community role and neighbourhood council. As for the climatic considerations in regard to the environmental context of Jeddah are; ventilation, shading, orientation, density and local materials. The discussed traditional ways provided a base for the proposed neighbourhood design guidelines.

## 5. The influence of modernism

In 1950s to 1960s after World War II and the Industrial Revolution in the West conjointly the Oil Boom in the Middle East; neighbourhood design shifted from traditional ways of design to modern ones. Modernist planning neglected the concepts of the traditional neighbourhood design. The main idea of this movement design was to separate land uses and density controls<sup>17</sup>. The perceptions of this movement have failed causing great damage to the urban environment<sup>18</sup>. *"After the discovery of oil, the country began to urbanize and modernize"*<sup>19</sup>. Current Saudi neighbourhoods adapted Western modern approaches rather than the concept of traditional neighbourhood design<sup>20</sup>. The utilization of foreign approaches shaped a new urban environment for Saudi cities; totally different from the traditional ones<sup>7</sup>. The most affected areas by urbanization are the major cities which are Riyadh, Jeddah, and Dammam<sup>6</sup>. According to Al-Hathloul; the Western planning of Al-Khobar in the Eastern province (figure 4) introduced a critical Western design prototype. This prototype influenced neighbourhood design of Riyadh, Jeddah and all the cities around the Kingdom. Moreover; of Jeddah planning was commercial and neighbourhood scale projects were not recognized<sup>3,19</sup>.

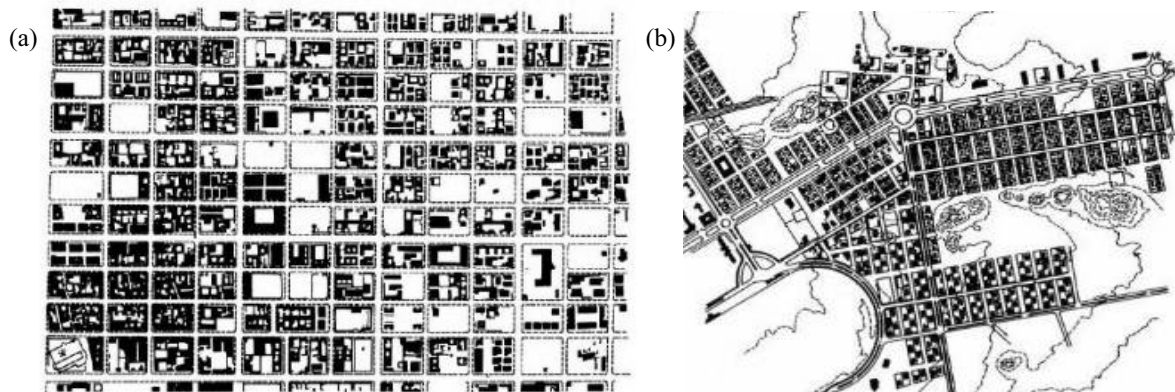


Fig. 4. (a) Al-Khobar Iron Grid Pattern; (b) Dammam ARAMCO Iron Grid Pattern<sup>7</sup>.

Saudi Arabia in its essence is a very conservative and private culture, which is highly reflected in its traditional way of design and planning. *"The tension between conservatism and modernism in urban Saudi Arabia resulted in a certain social resistance, and it has become necessary to discuss how this social resistance has been translated into forms"*<sup>21</sup>. Saudi community reacted to the imposed foreign modernization; forming a new contemporary third culture. The third culture adapted some traditional socio-cultural aspects; associated with foreign aspects and modernization<sup>21</sup>. Contemporary Saudi neighbourhoods are suffering from severe problems; due to the adaptation of Western design approaches (figure 5). Foreign neighbourhood design approaches affected both levels

of urban design principles and culture of Saudi neighbourhoods. As a result; neighbourhood of Saudi Arabia became socially unsustainable.

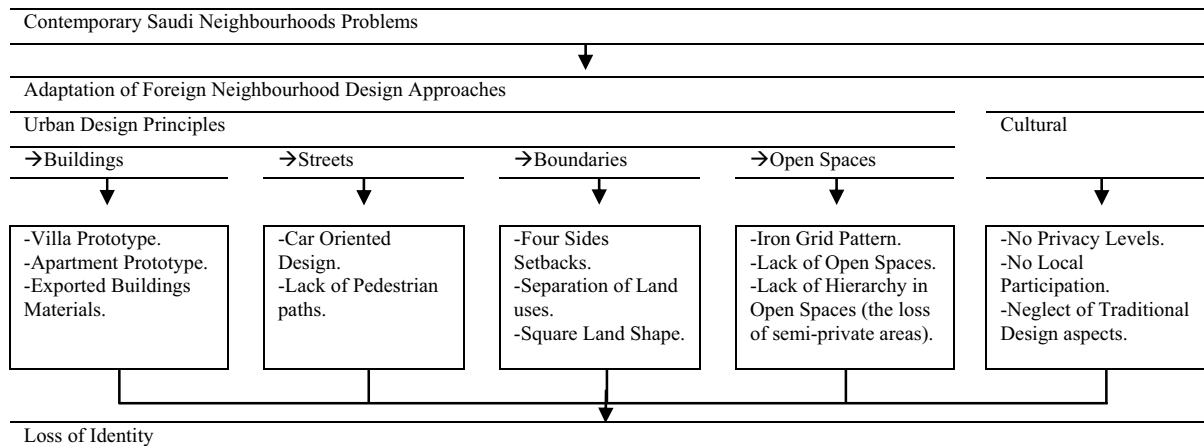


Fig. 5. Contemporary Saudi Neighborhood Design Problems, Done by: the third author.

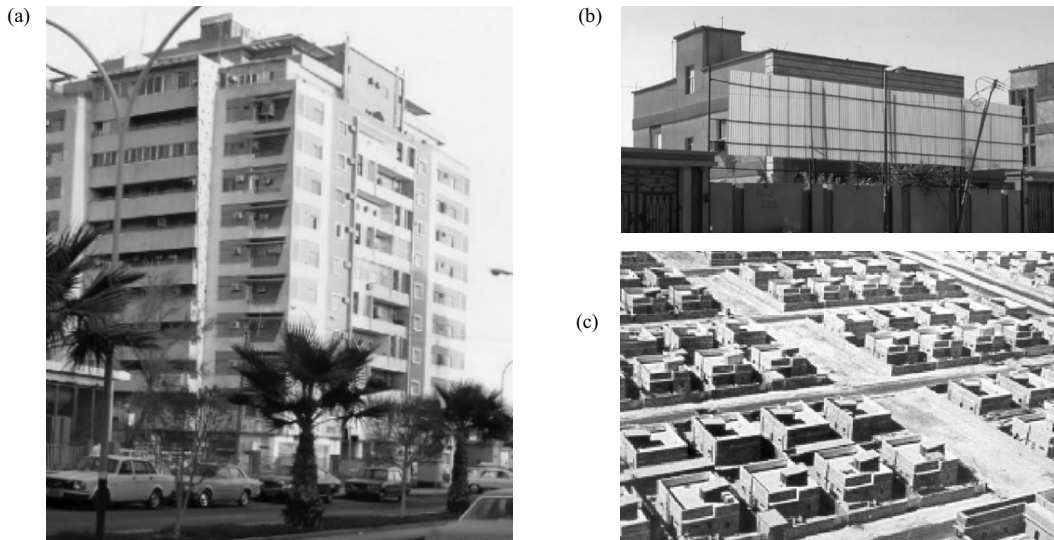


Fig. 6. (a) Riyadh Apartment Building; (b) housing screens; (c) Grid Iron Pattern and Detached Houses<sup>7</sup>.

### 6. Towards the sustainability approach

Due to the great harm brought by the Modernist approach in the West and the Middle East; new movements arose as a reaction to it. Since 1960s, Kevin Lynch, Jane Jacobs and Christopher Alexander among others tried to rehabilitate and restore the traditional socio-cultural aspects of the urban environments. Jacobs's mile stone opposition stressed on; the consideration of socio-cultural positive values in the traditional ways of the Neighbourhood Unit and Radburn Model<sup>18</sup>. The New Urbanists; Duany and Plater-Zyberk aimed to bring back concepts of the original ways of design under the approach of New-Urbanism<sup>15</sup>. In 1980s; the concept of Sustainable Development and Sustainable Rating Systems emerged adapting the principles of New Urbanism<sup>22</sup>. Environmental, Economic and Social are the key principles of Sustainable Neighbourhood Development<sup>23</sup>.

LEED-ND (2009) is considered an initial international rating system to pursue the concept of sustainable

neighbourhood development<sup>24</sup>. LEED rating systems became more environmentally oriented; abbreviating socio-cultural aspects in neighbourhood design<sup>25</sup>. Consequently; other regional rating systems such as QSAS in Qatar and Estidama Pearl in UAE occurred. The regional rating systems appeared; aiming to address their own distinctive socio-cultural aspects in relation to their natural environments<sup>26, 27</sup>. Today Saudi designs continue to follow the same approaches of the West. Evident to that; the adaption of LEED rating systems as the main design approach in leading projects such as KAUST in Jeddah and KAFD in Riyadh<sup>28, 29</sup>. In 2014; a relatively new approach responding to the abbreviation of socio-cultural aspects; is Circles of Sustainability. Circles of Sustainability highlighted the strong role of culture; assigning it as a main fourth principle to achieve sustainability<sup>30</sup>.

### 7. Initial sustainable socio-cultural guidelines for neighborhood design in Jeddah

According to previous attempts; it is evident that socio-cultural aspects were neglected in the design approaches of the Modernist period. Rating systems and evaluation assessments are lacking the strong bond with social and cultural aspects. Causing Saudi; in specific Jeddah's, neighbourhoods to be socially unsustainable. On the other hand, socio-cultural aspects were better addressed in the traditional ways of design. In order to achieve social sustainability for the current situation of Jeddah's neighbourhoods; a set of design guidelines obtained from the previous attempts in the Middle East and the West are proposed.

Figure 7 presents the initial proposed Design Guidelines for Stimulating Social Sustainability for Jeddah's Neighbourhoods. The guideline matrix presents; integration between the two of factors which are; Bio-Climatic conditions and Cultural aspects that govern urban design principles. Both factors includes five main elements. The Bio-Climatic conditions factor includes; ventilation, shading, orientation, density and local materials. As for the Cultural factor it includes; privacy, religious aspects, economic base, community role and neighbourhood council. Both factors should be applied on four essential levels; buildings, paths and streets, open spaces and boundaries. First, building levels considering; building Projections, Varsity of Building Heights (Tower like), Detached Buildings and Unity & Harmony. On the level of paths and streets; Access, Connectivity, Walk- ability and Adequate Width. The level of open spaces; Hierarchy of Open Spaces, Located at Intersections, Focal Points and Convection System. Finally, the boundaries level, Natural as Possible, Defined Centres, Defined Inner & Outer Boundaries, Cluster Design, Defined and Safety.

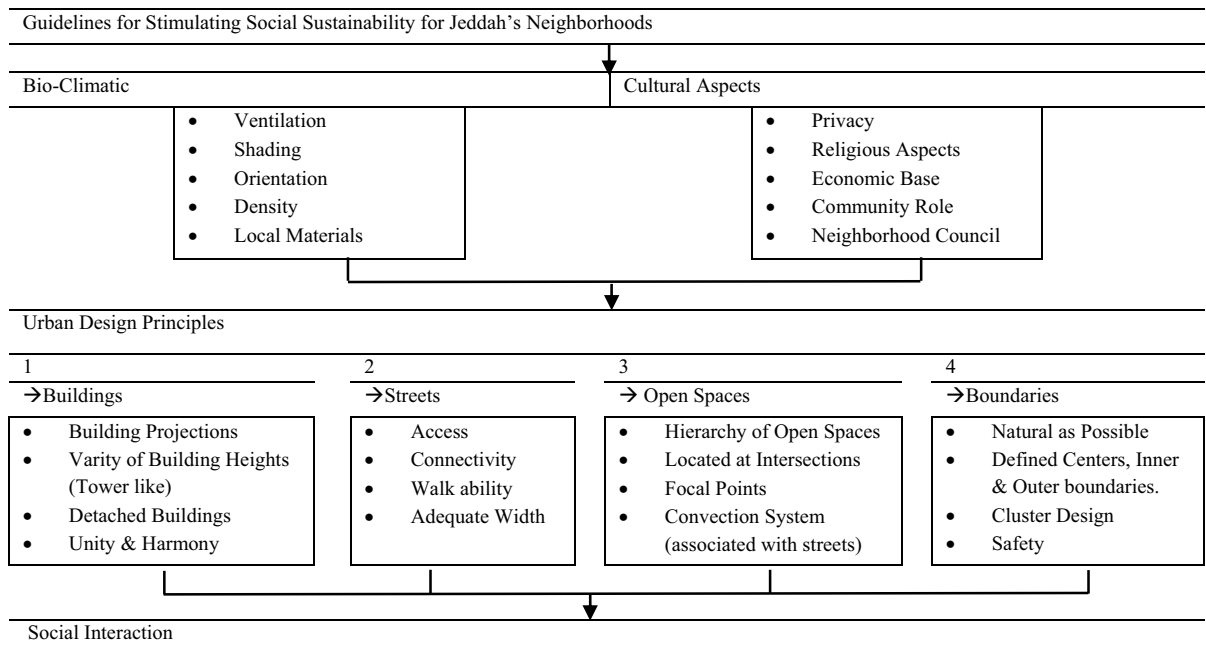


Fig. 7. Initial Guidelines for Stimulating Social Sustainability for Jeddah's Neighborhoods, Done by the third author.

## 8. Conclusion

The study was concerned by proposing a set of design guidelines governed with bio-climatic considerations and cultural aspects to stimulate social sustainability in Jeddah's neighborhoods. Main urban design principles were combined with the cultural aspects and bio-climatic considerations to propose a set of design guidelines. The proposed Sustainable Socio-Cultural Guidelines for Neighborhood Design in Jeddah aim to stimulate social sustainability for Jeddah's neighborhoods. The study presented important key findings and conclusions which can be summarized in:

- Traditional neighbourhood design approaches of Middle East and the West have addressed their own socio-cultural aspects; in relation to their natural environments.
- The main cultural aspects to consider for Jeddah are economic base, community role, neighbourhood council, privacy and religious aspects. Moreover; design considerations for Jeddah's climate are; are; Shading, Ventilation, Orientation, Local Materials and Density.
- Adapting modern foreign approaches of the West; is considered the main factor behind the fall back of Saudi neighbourhoods.
- Saudi neighbourhoods are facing major problems causing it to be socially unsustainable. As a result; the Saudi community developed a third culture of resistance.
- Sustainability approaches in the West aimed to reform the harm caused by the modernist approach. These approaches became environmentally oriented abbreviating social and cultural aspects. Recent national sustainability approaches are attempting to achieve sustainability for their natural environments in relation to their own culture.

Thus; the community's way of thinking should be reformed through affective design to bring back social interactions into Jeddah's neighbourhoods. In accordance with 29 % of experts; both bio-climatic consideration in respect to cultural aspects are major factors for social sustainability in Jeddah's neighbourhoods. The proposed guidelines can utilize by urban designers in the process of design in the context of Jeddah city. These guidelines could be summarized in the following points:

- The Bio-Climatic considerations factor promote the consideration of shading, ventilation, orientation, local materials and proper densities by urban designers to achieve thermal comforts in urban spaces.
- The Cultural Aspects factor foster the preservation of Jeddah's inhabitants culture and way of life; through the consideration of the following aspects; economic base, community role, neighbourhood council, privacy and religious aspects.
- Both factors should be applied on four essential levels; buildings, paths and streets, open spaces and boundaries.

Sustainable socio-culture is a very recent field of study. An application of the proposed guidelines can be done to produce socially sustainable neighbourhood designs in Jeddah. Further studies may be done targeting social sustainability in several other contexts and areas in Saudi Arabia.

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<sup>1</sup> This paper presents the findings of a master research done by the main author as partial fulfilment for the requirement of the Degree of MSc. Urban Design & practices under the supervision of the second and the third authors.